CLAIMS:

1. A self-adjusting OADM (optical add-drop multiplexer) comprising:

at least one beam separator;

at least one beam combiner;

a controller having first and second optical inputs and a control output, the first optical input being in optical communication with the beam separator, the controller being adapted to generate a control signal at the control output in accordance with the relative power of first and second monitoring signals at the first and second optical inputs, the first and second monitoring signals representing predetermined portions of first and second optical signals; and

a variable optical attenuator in optical communication with the beam combiner and having a control input connected to the control output of the controller, the second optical signal passing through the variable optical attenuator for attenuation by the variable optical attenuator in accordance with the control signal.

2. The self-adjusting OADM of Claim 1, wherein the first signal comprises a channel of a wavelength division multiplexed (WDM) signal which is optically selected by the beam separator.
3. The self-adjusting OADM of Claim 2, further comprising an optical tap disposed between the beam separator and the controller, the optical tap directing a predetermined portion of the first optical signal to the first optical input of the controller.
4. The self-adjusting OADM of Claim 1, further comprising an optical tap disposed between the variable optical attenuator and the beam combiner, the optical tap

directing a predetermined portion of the second optical signal to the second optical input of the controller.

5. A fiber network defining an optical path in which a wavelength division multiplexed (WDM) signal comprising one or more channels is propagated between an interconnection line and one or more subscribers, the fiber network comprising:

an optical amplifier disposed in the optical path; and

a self adjusting optical add-drop multiplexer (OADM) disposed in the optical path and in optical communication with a first subscriber such that an add signal from the first subscriber is directed to the optical path by the self-adjusting OADM and is power adjusted such that the power of the add signal matches the power of a first channel of the OADM signal.

6. The fiber network of Claim 5, wherein the first channel is a drop channel having an optical signal which is directed by the self-adjusting OADM to the first subscriber.

7. The fiber network of Claim 5, wherein the OADM comprises:

a beam separator disposed in the optical path;

a beam combiner disposed in the optical path;

a variable optical attenuator in optical communication with the beam combiner and having a control input, the add signal passing through the variable optical attenuator for attenuation by the variable optical attenuator in accordance with a control signal at the control input; and

a controller having a first optical input for receiving a predetermined portion of the drop signal, a second optical input for receiving a predetermined portion of the add signal, and a control output in communication with the control input of the

variable optical attenuator, the controller generating the control signal in accordance with the relative power of the predetermined portions of the add and drop signals.

8. The fiber network of Claim 7, wherein the self-adjusting OADM further comprises an optical tap disposed between the beam separator and the controller, the optical tap directing the predetermined portion of the drop signal to the first optical input of the controller.

9. The fiber network of Claim 7, wherein the self-adjusting OADM further comprises an optical tap disposed between the variable optical attenuator and the beam combiner, the optical tap directing the predetermined portion of the add signal to the second optical input of the controller.

10. An optical switching assembly comprising:

a first optical add-drop multiplexer having an input port for receiving a wavelength division multiplexed (WDM) signal comprising one or more channels and an output port from which at least one signal representing one of said channels is output as a first drop signal;

a second optical add-drop multiplexer having an input port for receiving a wavelength division multiplexed (WDM) signal comprising one or more channels and an output port from which at least one signal representing one of said channels is output a second drop signal;

a controller in optical communication with the output ports of the first and second optical add-drop multiplexers, the controller issuing a control signal in accordance with the relative optical powers of predetermined portions of the first and second drop signals; and

an optical switch in optical communication with the output ports of the first and second optical add-drop multiplexers, the optical switch having adapted to operate in one of first and second states in accordance with the control signal from the controller, wherein in the first state an optical signal from the output port of the first optical add-drop multiplexer is propagated through the switch, and in the second state an optical signal from the output port of the second optical add-drop multiplexer is propagated through the switch.

11. The optical switching assembly of Claim 10, wherein the controller is adapted to receive a predetermined portion of the optical power of at least one add signal, and to issue an attenuation signal in accordance with the relative optical powers of the predetermined portions of optical power of the add signal and the first and second drop signals, the optical switching assembly further comprising at least one variable optical attenuator operating on the add signal for attenuating the add signal in accordance with the attenuation signal.

12. The optical switching assembly of Claim 10, wherein the controller is adapted to receive a predetermined portion of the optical power of first and second add signals, and to issue first and second attenuation signals in accordance with the relative optical powers of the predetermined portions of optical power of the first and second add signals and the first and second drop signals, the optical switching assembly further comprising first and second variable optical attenuators operating on the first and second add signal, respectively, for attenuating the first and second add signals in accordance with the first and second attenuation signals.

13. The optical switching assembly of Claim 10, further comprising first, second and third optical taps for directing the first, second and third predetermined portions to the controller.

14. The optical switching assembly of Claim 10, wherein the first and second optical add-drop multiplexers each comprises at least a beam separator and at least a beam combiner.

15. The optical switching assembly of Claim 10, wherein the controller issues an alarm signal if the predetermined portion of optical power of at least one of the first and second drop signals exceeds a predetermined level.

16. The optical switching assembly of Claim 10, wherein the controller issues an alarm signal if the predetermined portion of optical power of at least one of the first and second drop signals is below a predetermined level.

17. The optical switching assembly of Claim 10, wherein the controller issues an alarm signal if the predetermined portion of optical power of the first and second drop signals is below a predetermined level.

18. A two-fiber ring network having first and second fiber rings defining first and second optical paths in which first and second wavelength division multiplexed (WDM) signals each comprising one or more channels is respectively propagated between an interconnection line and one or more subscribers, the two-fiber ring network comprising:

a switching assembly comprising:

a first optical add-drop multiplexer having an input port for receiving the wavelength division multiplexed signal from the first optical path and an

output port from which at least one signal representing one of said channels is output as a first drop signal;

a second optical add-drop multiplexer having an input port for receiving the wavelength division multiplexed (WDM) signal from the second optical path and an output port from which at least one signal representing one of said channels is output a second drop signal;

a controller adapted to receive predetermined portions of the first and second drop signals and to issue a first control signal in accordance with the relative power of the first and second predetermined portions; and

an optical switch adapted to operate in a first or second state in accordance with the first control signal, wherein in the first state the optical switch propagates the first drop signal through the optical switch and in the second state the optical switch propagates the second drop signal through the optical switch.

19. The network of Claim 14, further comprising at least one optical amplifier disposed in one of said first and second optical paths.

20. The network of Claim 14, wherein the controller is adapted to receive a predetermined portion of the optical power of at least one add signal, and to issue an attenuation signal in accordance with the relative optical powers of the predetermined portions of optical power of the add signal and the first and second drop signals, the switching assembly further comprising at least one variable optical attenuator operating on the add signal for attenuating the add signal in accordance with the attenuation signal.

21. The network of Claim 14, wherein the controller is adapted to receive a predetermined portion of the optical power of first and second add signals, and to issue first and

second attenuation signals in accordance with the relative optical powers of the predetermined portions of optical power of the first and second add signals and the first and second drop signals, the optical switching assembly further comprising first and second variable optical attenuators operating on the first and second add signal, respectively, for attenuating the first and second add signals in accordance with the first and second attenuation signals.

22. The network of Claim 14, wherein the switching assembly further comprises first, second and third optical taps for directing the first, second and third predetermined portions to the controller.

23. The network of Claim 14, wherein the controller issues an alarm signal if the predetermined portion of optical power of at least one of the first and second drop signals exceeds a predetermined level.

24. The network of Claim 14, wherein the controller issues an alarm signal if the predetermined portion of optical power of at least one of the first and second drop signals is below a predetermined level.

25. The network of Claim 14, wherein the controller issues an alarm signal if the predetermined portion of optical power of the first and second drop signals is below a predetermined level.

26. The network of Claim 14, wherein the first and second optical add-drop multiplexers each comprises a beam separator and a beam combiner.

27. A method for controlling the power of an add channel of an optical add-drop multiplexer (OADM) used to add the add channel to a wavelength division multiplexed (WDM) signal including one or more express WDM channels and to drop a drop channel from the WDM signal, the method comprising:

comparing the power of the add channel with the power of the drop channel; and

attenuating the power of the add channel to match the power of the express WDM channels.

28. The method of Claim 18, wherein the act of comparing comprises:

monitoring predetermined portions of the add and drop channels; and

comparing the predetermined portions.

29. The method of Claim 19, further comprising issuing a control signal representative of a result of comparing the predetermined portions, the act of attenuating comprising attenuating the power of the add channel in accordance with the control signal.

30. A method for selectively directing, to a receiver, the optical signal of a predetermined channel of a wavelength division multiplexed (WDM) signal of a two-fiber ring, the two-fiber ring having a first ring and a second ring each adapted to propagate said predetermined channel, the method comprising:

comparing at least a portion of the power of the optical signal of the predetermined channel of the first ring with at least a portion of the power of the optical signal of the predetermined channel of the second ring; and

directing the signal of the predetermined channel having the greater power to the to the receiver.

31. The method of Claim 30, wherein the wavelength division multiplexed signal is optically amplified.

32. The method of Claim 30, further comprising issuing an alarm signal if the power level of at least one of the compared portions exceeds a predetermined level.

33. The method of Claim 30, further comprising issuing an alarm signal if the power level of both compared portions exceeds a predetermined level.

34. The method of Claim 30, further comprising issuing an alarm signal if the power level of at least one of the compared portions is below a predetermined level.

35. The method of Claim 30, further comprising issuing an alarm signal if the power level of both of the compared portions is below a predetermined level.

36. A method for conducting a wavelength division multiplexed (WDM) signal between an interconnection line and one or more subscribers using a fiber ring network, the WDM signal comprising a plurality optical signals each associated with a channel, the method comprising:

comparing the power of a predetermined channel of the WDM signal from the fiber network with the power of an add channel from a subscriber;

attenuating the power the of the add channel as necessary to match the power of the predetermined channel; and

combining the add channel with the WDM signal.

37. The method of Claim 35, wherein the fiber ring network comprises a two-fiber ring having first and second rings each adapted to propagate the predetermined channel, said method further comprising comparing the power of the predetermined channel from each of the first and second rings.

38. The method of Claim 35, further comprising directing the predetermined channel with the greater power to an optical receiver of a subscriber.

39. The method of Claim 35, further comprising optically amplifying the WDM signal.